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Applicant(s): CHECKROBOT INC (US) ;

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IPC Classification: G07G1/12 ;

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ABSTRACT:

An operator-unattended system for the processing of articles selected for purchase includes a subsystem for processing discount coupons bearing codes indicative of the identity of an article and a coupon monetary value. The subsystem comprises a coupon receiver (48) for reading the codes of received coupons and a coupon validator (62) and means for returning the coupon to a customer of the article. A storage device (42) stores signals indicative of the identity of all articles selected for purchase by the customer as derived from the operator-unattended system. A coupon discount totalizer (74) receives those signals from the coupon receiver for which a coupon validation signal is generated and a signal, derived from the operator-unattended system and indicative of price totalization for all the articles selected for purchase and subtracts the monetary value in each of the received signals from the monetary value indicated in the price totalization signal.

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(54) Coupon processing and checkout system

(57) An operator-unattended system for the processing of articles selected for purchase includes a subsystem for processing discount coupons bearing codes indicative of the identity of an article and a coupon monetary value. The subsystem comprises a coupon receiver (48) for reading the codes of received coupons and a coupon validator (62) and means for returning the coupon to a customer of the article. A storage device (42) stores signals indicative of the identity of all articles selected for purchase by the customer as derived from the operator-unattended system. A coupon discount totalizer (74) receives those signals from the coupon receiver for which a coupon validation signal is generated and a signal, derived from the operator-unattended system and indicative of price totalization for all the articles selected for purchase and subtracts the monetary value in each of the received signals from the monetary value indicated in the price totalization signal.

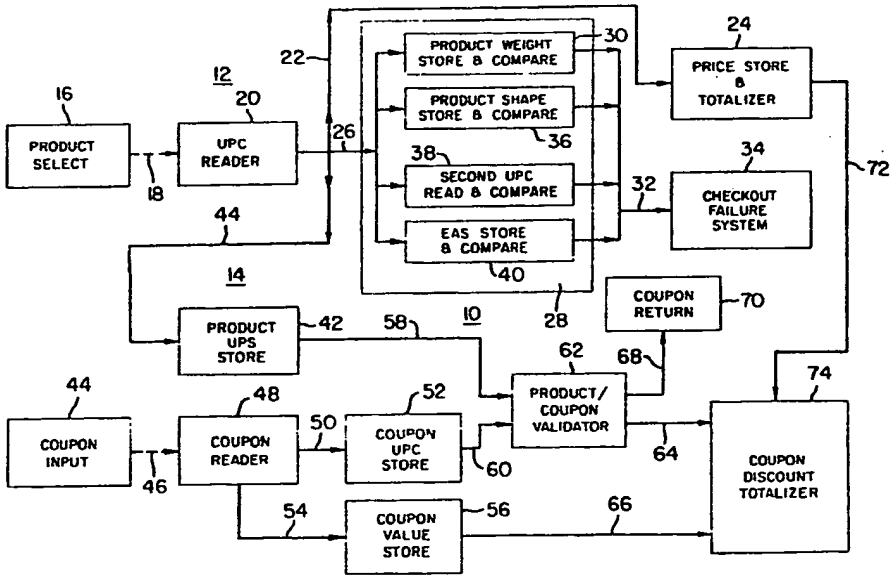

FIG. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

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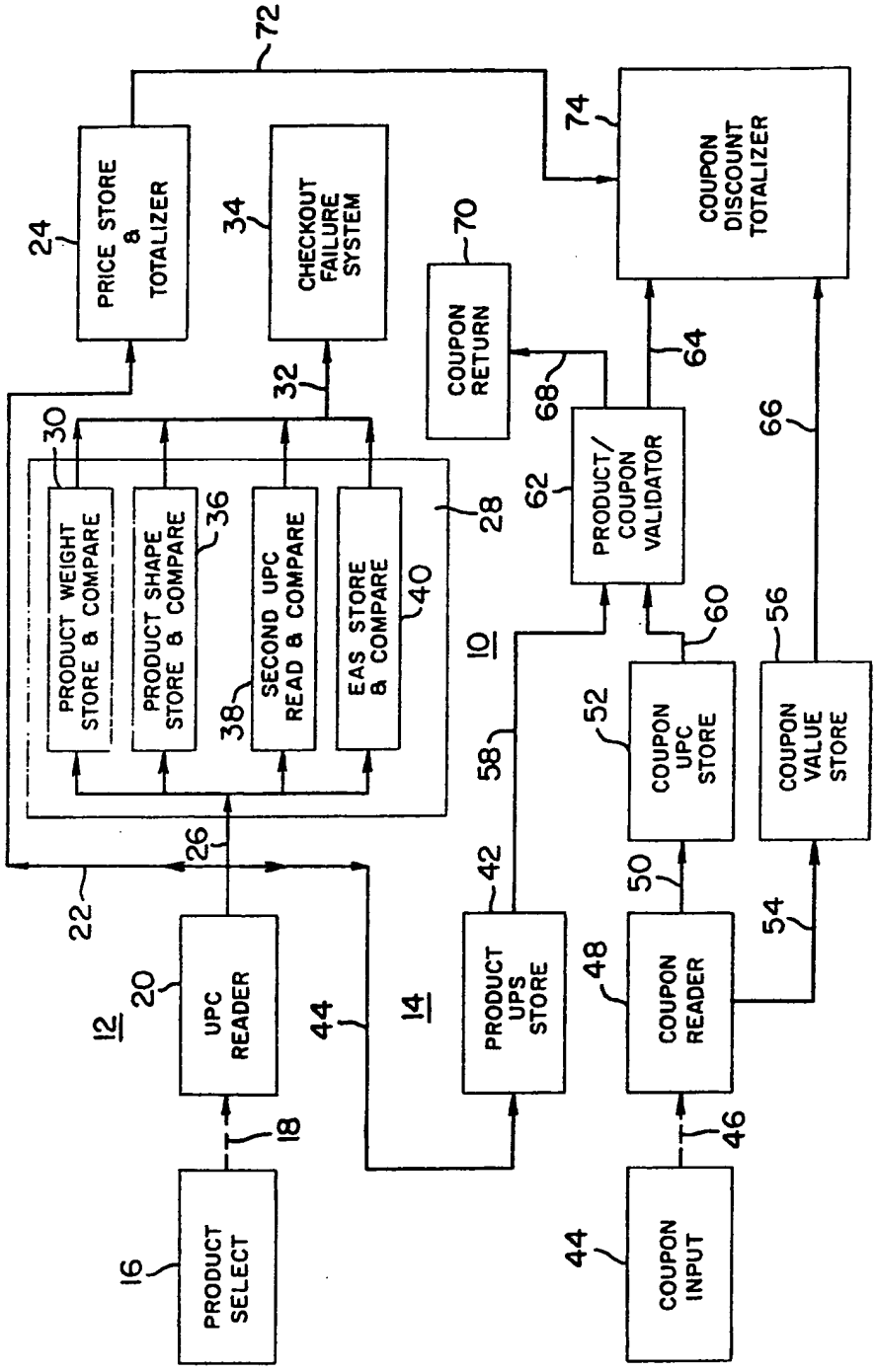
PRODUCT SELECT
UPC READER
PRODUCT UPS STORE
COUPON INPUT
COUPON READER
COUPON UPC STORE
COUPON VALUE STORE
PRODUCT/ COUPON VALIDATOR
COUPON RETURN
COUPON DISCOUNT TOTALIZER
PRICE STORE & TOTALIZER
CHECKOUT FAILURE SYSTEM
PRODUCT WEIGHT STORE & COMPARE
PRODUCT SHAPE STORE & COMPARE
SECOND UPC READ & COMPARE
EAS STORE & COMPARE
10
12
14
16
18
20
22
24
26
28
30
32
34
36
38
40
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72
74

FIG. 1

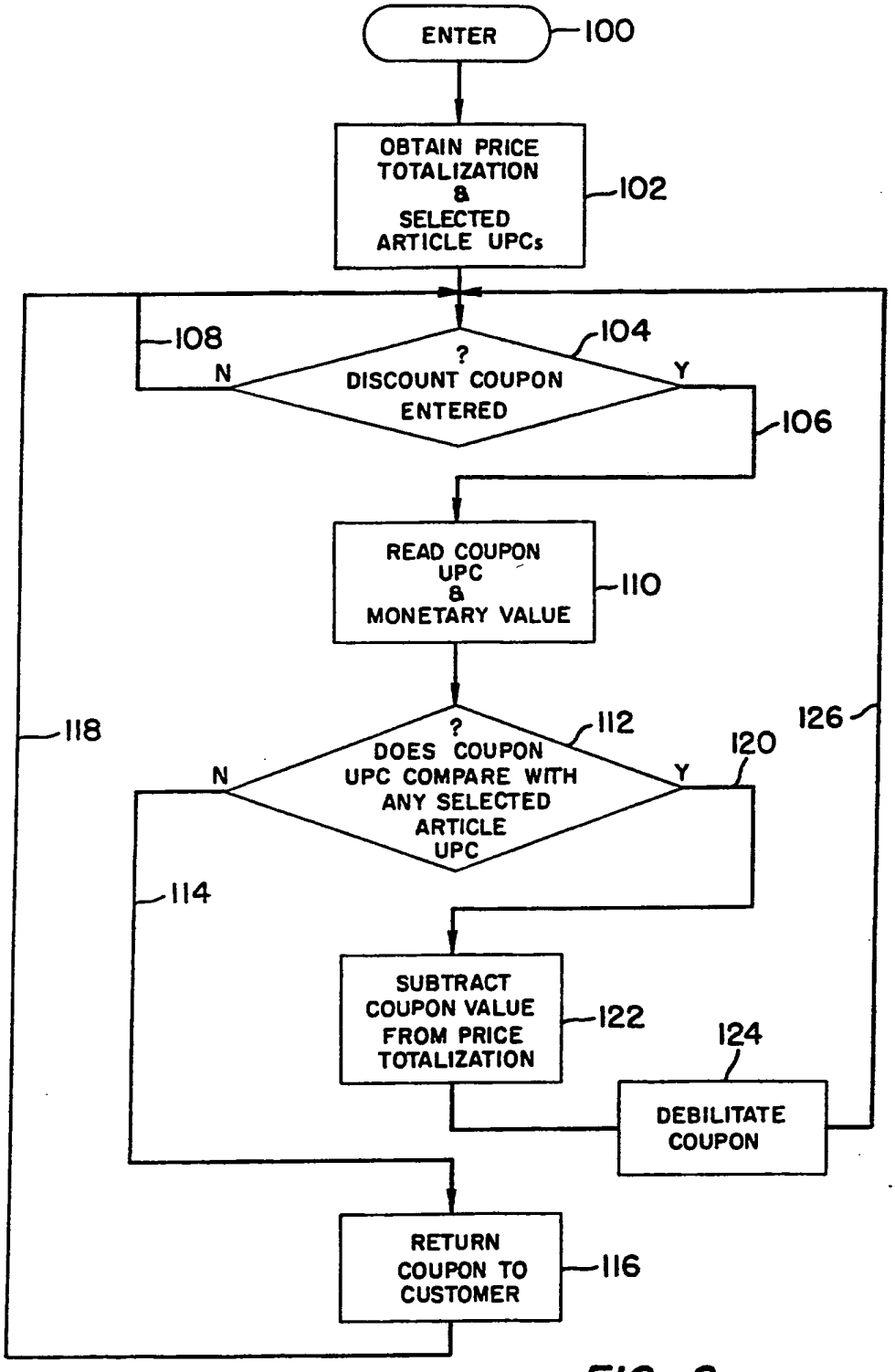
ENTER
100
OBTAIN PRICE TOTALIZATION & SELECTED ARTICLE UPCs
102
?
DISCOUNT COUPON ENTERED
104
N
Y
108
106
READ COUPON UPC & MONETARY VALUE
110
?
DOES COUPON UPC COMPARE WITH ANY SELECTED ARTICLE UPC
112
N
Y
120
118
126
114
SUBTRACT COUPON VALUE FROM PRICE TOTALIZATION
122
124
DEBILITATE COUPON
RETURN COUPON TO CUSTOMER
116

FIG. 2

"A COUPON PROCESSING AND CHECKOUT SYSTEM"

The present invention relates generally to the processing of discount coupons for retailed articles and pertains more particularly to systems and methods for automated checkout in supermarkets and like facilities with attendant processing of discount coupons.

Our United States Patent Specification Nos. 4,676,343 and 4,792,018, disclose systems for the automated checkout of articles selected by a customer for purchase in supermarkets and like facilities. The former specification involves an arrangement addressing articles which bear a so-called "universal product code" (UPC), typically in the form of a bar code uniquely indicative of the identity of the article bearing the code. The UPC of each article selected for purchase is scanned or read and a signal indicative of the article identity is generated and applied to a central processing unit which has stored in an associated memory the UPCs of all articles available for purchase which are so encoded, correlated with the price and other characteristics of the articles, such as weight.

Articles are placed on a conveyor following UPC scanning and thereby fed into a so-called "security tunnel", which is guarded against customer fraud by various light curtains, which are in the form of light sources and associated photocells. In the course of article conveyance, its weight is physically measured and a signal is generated indicative of the measurement.

Comparison is made of the stored, weight-indicative signal and the physical measured signal. If the comparison is negative, indicative of a potential customer fraud, article processing is interrupted and various courses of action are obtainable, one being the reverse movement of the conveyor. Otherwise, in the course of continuing positive comparison results, the customer's order is carried forward, with price totalization effected from stored price-indicative signals.

In the latter specification, a number of further security measures are effected to detect customer fraud or checkout failure. In one such additional measure, article shape is detected, such as by the light curtain at the entry to the security tunnel. The CPU storage includes, with the article identity code a cross-correlation of article shape. This compilation is desirably made from the system itself, as by storage of detected article shape in a system set up mode, through use of the light curtain output signals.

A second additional measure is the repeat reading of article UPC in the security tunnel and comparison of the same with that read by the scanner. checkout failure would be present on negative comparison in this respect.

A third additional measure is the introduction of electronic article surveillance (EAS) practice in the security tunnel. Here, storage is made with UPC of whether or not the article so encoded should have an EAS tag thereon. If the article is detected as having an EAS tag thereon and storage indicat s that it should not, such as

would be the case where a customer tries fraudulently to substitute an expensive wine purchase for a cheaper wine subjected to UPC scanning, checkout failure would again occur.

Separately from the above systems, various efforts have been made to automate the processing of discount coupons for articles available for purchase. Thus, the art has looked to encoding coupons with article UPC identity and to automated receipt and scanning of the coupons for such UPC identity. From the Applicants' viewpoint, known coupon processing systems independently configured, and those having coordination with a parent automated checkout system, do not meet present industry requirements.

It is an object of the present invention to provide an improved system for processing discount coupons.

A further object of the present invention is to provide enhanced coordination of automated checkout systems and automated coupon processing subsystems for use therewith.

In accordance with the present invention there is provided a system for operator-unassisted processing of articles selected for purchase and having facility for reading codes on the articles indicative of the identity thereof and for providing price totalization for the articles, a subsystem for the processing of coupons bearing codes indicative of the identity of an article and a coupon monetary value, the subsystem comprising:

(a) a receiver for receiving the coupons and for

reading the codes thereon and generating first and second output signals per coupon read and respectively indicative of the article identity and the monetary value;

(b) means for storing signals received from said operator-unassisted processing system and indicative of the identity of all articles selected for purchase;

(c) coupon validation means for comparing the first signals obtained from the coupon receiving means with the stored article identity signals and generating a coupon validation signal for each positive comparison; and

(d) coupon discount totalizing means for receiving those of the second signals of the coupon receiving means for which a coupon validation is generated and a signal indicative of price totalization from said operator-unassisted processing system and for subtracting the monetary value in each the received second signal from the monetary value indicated in the price totalization signal.

The present invention will now be described in greater detail by way of example with reference to the accompanying drawings, wherein:-

Fig. 1 is a block diagram of the subsystem of the invention in combination with the block diagram of the above referred to US Patent Specifications; and

Fig. 2 is a flow chart of the operations involved in the system and practice of the present invention.

Referring to Fig. 1, a system 10 includes an upper channel 12 which is configured in accordance with the above

referred to US Patent Specifications, and a lower channel 14 configured in accordance with the present invention. Upper channel 12 has a product select aspect 16, wherein a customer selects articles for purchase, dotted line 18 indicating the mechanical passing of the selected articles individually to UPC reader or scanner 20. The output of the reader is applied over a line 22 to a price store and totalizer 24, whereby reference is made to the system memory to obtain the price of the selected article and to totalize the prices thus obtained.

The scanned UPC identification, per selected article, provided on a line 26, gives rise to the obtaining of the weight of the article from memory on entry of the article into a security tunnel 28. Comparison is effected with an actual weight measurement of the selected article in product a weight store and compare unit 30, the comparison result (when negative) being applied over a line 32 to a checkout failure system 34, which provides suitable output indication of the checkout failure, possibly due to customer fraud.

In following the procedures outlined in the second referred U.S. Patent Specification, the line 26 UPC identification signal is applied to a product shape store and compare unit 36, which effects a comparison of memory stored article shape characteristics with those obtained from article examination, such as would be obtained from the entry light curtain associated with the security tunnel. The UPC identification signal may also be applied from the

line 26 to a second UPC read and compare unit 38, wherein the article UPC is again read in the security tunnel and compared with that obtained from the reader 20. Further, the line 26 signal may be applied to an EAS store and compare unit 40 which functions as above described. The outputs, on failure of positive results in comparisons in units 36,38 and 40, apply an actuating input over a line 32 to a checkout failure system 34.

Lower channel 14 includes a product UPC store 42, which accumulates signals provided on a line 43 provided by the reader 20 and indicative of the UPCs of articles selected for purchase by a customer. Channel 14 further includes a coupon input unit 44, which may be configured in customary ATM (automated teller machine) fashion, to accept paper coupons and to furnish the same to a coupon reader 48 as by a mechanical passer 46, the reader examining the UPC and value indications thereon. The coupon codes, respectively indicative of the UPC indication and monetary value, are applied by the reader 48 in the first instance over a line 50 to a coupon UPC store 52 and in second instance over a line 54 to a coupon value store 56.

Lower channel 14 further includes lines 58 and 60 which respectively provide the output signals of products UPC store unite 42 and stored coupon reader UPC indications to a product/coupon validator 62, which furnishes a validation signal over a line 64 where correspondence exists as among the line 58 and line 60 signals. The coupon value signal from the store 56 is furnished on a line 66.

Should there not be a match as between the signals on lines 58 and 60, unit 62 applies over a line 68 to a coupon return unit 70, whereupon the coupon is returned to the customer.

Assuming there to have been a line 64 indication as to confirmation of the coupon as corresponding with articles selected for purchase, a coupon discount totalizer 74 is responsive to the line 64 indication of correspondence to discount the line 72 signal from the price store and totalizer unit 24 by the indication of discount (coupon value) from line 66. At this time also, the coupon is supplied to a coupon depository, wherein the received coupon is suitably defaced or otherwise debilitated as to not be machine readable, but verifiable by human inspection.

Operation of subsystem 14 of Fig. 1 will be further explained with reference to the flow chart of Fig. 2.

The subsystem is entered (ENTER) in step 100. In step 102 (OBTAIN PRICE TOTALIZATION & SELECTED ARTICLE UPCs), reference is made to the checkout system, such as system 12 of Fig. 1, and the customer's order is noted both as to the total price for all articles selected by the customer and the UPCs for each article.

In step 104 (? DISCOUNT COUPON ENTERED), inquiry is made as to whether a discount coupon has been entered by the customer and, if so, it is verified, and affirmative indication is provided on line 106. If the inquiry is answered in the negative, line 108 returns the subsystem to

step 104 for processing of the next entered coupon.

Line 106 leads to step 110 (READ COUPON UPC & MONETARY VALUE), wherein signals are generated which are respectively indicative of the coupon UPC and the discount monies applicable to the coupon.

Step 112)? DOES COUPON UPC COMPARE WITH ANY SELECTED ARTICLE UPC) follows and involves a comparison of the coupon UPC signal with signals indicative of each of the UPCs obtained in step 102. Where the result of the comparison is negative, line 114 leads to step 116 (RETURN COUPON TO CUSTOMER), and the customer is provided with the coupon as originally entered for use in subsequent shopping. Line 118 returns the subsystem to step 104 for further coupon processing.

If the step 112 inquiry is answered in the affirmative, line 120 leads to step 122 (SUBTRACT COUPON VALUE FROM PRICE TOTALIZATION), the discount monies applicable to the coupon indicated in the corresponding signal generated in step 112 are subtracted from the price totalization obtained in step 102. The result of this subtraction now replaces the totalization of price obtained in step 102, to be used in step 122 in processing the next coupon entered and found applicable to the customer's purchase order.

In step 124 (DEBILITATE COUPON), the discounted coupon is treated, as by diagonal black line marking thereon, so as not to be readable thereafter in a UPC reader. The debilitated coupon is desirably now placed in a

depository. Flow of the subsystem returns over line 126 to step 104 for processing of the next entered coupon.

At the conclusion of processing of all coupons entered, the successively decremented price totalization then available from step 122 is identified as the final checkout price to the consumer and associated checkout electronics. The completion of submission of coupons may be indicated by customer input to the subsystem.

Various changes to the system block diagram and modifications to the practice discussed may be made without departing from the invention. Thus, the particularly described preferred embodiment and method are intended in an illustrative and not in a limiting sense. The scope of the invention is set forth in the following claims.

CLAIMS:

1. An operator-unattended system for processing articles selected for purchase and having facility for reading codes on said articles indicative of the identity thereof and for providing price totalization for said articles, including a subsystem for the processing of coupons bearing codes indicative of the identity of an article and a coupon monetary value, said subsystem including:

(a) means for receiving said coupons and for reading said codes thereon and generating first and second output signals per coupon read and respectively indicative of said article identity and said monetary value;

(b) means for storing signals received from said operator-unattended system and indicative of the identity of all articles selected for purchase;

(c) coupon validation means for comparing said first signals obtained from said coupon receiving means with said stored article identity signals and generating a coupon validation signal for each positive comparison; and

(d) coupon discount totalizing means for receiving those of said second signals of said coupon receiving means for which a coupon validation is generated and a signal from said operator-unassisted processing system and indicative of price totalization from said processing system and for subtracting the monetary value in each said received second signal from the mon tary valu indicated in

said price totalization signal.

2. A system according to claim 1, wherein said coupon receiving means is responsive to a control signal for returning said coupon to a customer of said articles and wherein said coupon validation means generates said control signal upon each negative comparison and applied the same to said coupon receiving means.

3. An operator-unattended system for processing articles selected for purchase, constructed substantially as herein described with reference to and as illustrated in the accompanying drawings.

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